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ABSTRACT

Papers on social science libraries presented at the 1986 International Federation of Library Associations (IFLA) conference include: (1) "Efforts at Computerization in Nigerian Libraries--A State of Development Review" (A. Olugboyega Banjo, Nigeria); (2) "The Information Activities of the National Library of Economics in the Federal Republic of Germany--Transition from Traditional Library Services to Computer-Based Information Systems" (Ekkehart Seusing, West Germany); (3) "Library Automation Activities at Helsinki School of Economics Library and in Finland" (Kyllikki Ruokonen, Finland); (4) "The Impact of Optical Disc Publishing on the Information Community (CD-ROM: Compact Disc--Read Only Memory)" (W. Bartenbach, United States); (5) "Databases Created by Japanese Economists" (Yoshiro Matsuda, Japan); and (6) "The Role of the Libraries for the Assistance of Research in the Field of Social Sciences" (A. Kasyanenko, USSR). (KM)

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IFLA GENERAL CONFERENCE, TOKYO

1986

Division: Special Libraries

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Efforts at computerization in Nigerian Libraries: a state of development review.

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This paper requires a justification. Computerization of the entire library system or aspects of it is still very much the preserve of libraries in the "information rich" countries and at conferences where such developments are discussed, librarians from the "information poor" countries tend to be largely observers. Some would even argue that Third World librarians are faced with more fundamental problems of building basic library services in environments plagued with high levels of illiteracy, scarcity of reading materials and very low library/population ratios. Furthermore, as is indeed indicated in the title of the paper, this study is about efforts rather than achievements. It is therefore arguable whether this study is not somehow premature.

In spite of the above reservations, it is argued that studies such as the present one have an important role to play in developing the subject. In the first place, case studies such as this, complete with details of their failures and successes, will provide useful lessons for others particularly where there are critical socio-political and infrastructural similarities. Secondly, studies like this also provide an important basis for collaborative action as will be argued later. Thirdly, and perhaps most importantly, it is the conviction of this writer that the revolutionary changes which computerization and the associated advances in telecommunication have in recent years introduced into library and information services have crucial repercussions for those providing library and information services in both the "information rich" and the "information poor" parts of the world now and in future. Although there are still serious economic, technological and cultural barriers to be overcome, the signs are now that the "information gap" can be overcome, thanks to the current technological revolution, if Third World countries can develop their capability, through electronic networks, to access the data bases of the developed world.[1] The prospect for this is being improved through the development and improvement of such capability in some of the Third World countries as well as through similarly positive developments in computer, particularly micro-computer, technology, leading to substantial improvements in their capability at the same time as their prices have been declining.

II

The history of modern libraries in Nigeria is linked to the country's colonial experience and the development of higher education and research. It is important to note in this connection that English is Nigeria's official language and as such books in English language form the overwhelming proportion of library acquisitions. Because of the close links between libraries and education and research, the most prominent libraries in Nigeria are those serving higher educational institutions, particularly universities, and libraries serving research institutions in such areas as science and technology, finance,economics, foreign and strategic studies and law. There is also a National library. Thus, although there is a proliferation of libraries of various kinds, the foregoing are the really substantial ones in terms of personnel, stocks, budget and services.[2] There was a rapid expansion in higher education in the 1970s leading to the establishment of several Federal and State universities and Colleges of Technology. That period was also one of relative prosperity for Nigeria because of the huge resources derived from the sale of Nigerian crude oil. This prosperity was reflected in the increase in library budgets during the same period. Conversely the recent decline in the Nigerian economy resulting from the decline in oil revenues and the resultant curtailment in foreign expenditure has had an adverse effect on library budgets.

It should also be noted in this connection that most of the publications acquired by Nigerian libraries are from British and American sources.[3] This has therefore made libraries in the Nigerian context vulnerable to adverse developments in the country's foreign trade relations with those two countries in current times. Furthermore, it does mean that Nigeria has to be sensitive to developments in bibliographic and related practices in Britain and America.

There is very wide disparity in the quantity and quality of resources available in the various libraries. The oldest university libraries: Ibadan, Ahmadu Bello, Nsukka, Lagos and Ife have substantial undergraduate

and research collections in most academic desciplines, whereas the twenty or so newer Federal and State universities are relatively still under-developed. Also, whereas the National Library and a few Special Libraries are able to operate fairly credible services with a reasonable level of resources, many of the Special and Public Libraries are in a period which can best be described as decline rather than growth.

Although libraries of all types derive practically all their operating budgets from public sources and it would have been reasonable to expect a highly developed scheme of resource sharing, such a scheme has not gone beyond discussion stages.[4] A National Union Catalogue at the National Library of Nigeria which is expected to provide the basis for such a scheme is severely handicapped by the existing manual system of operation.[5]

Finally, it is probably fair to say that of the estimated 1,000 librarians in Nigeria only very few have ever had any training in informatics nor had any hands-on experience in computer applications in library and information service.[6]

III

The University of Lagos was the first to establish a computer laboratory in Nigeria in 1965 with an IBM 1620 computer.[7] This laboratory later developed into a full-fledged degree awarding Faculty. According to a survey[8] of computer facilities in Nigeria, the first applications only date back to 1972. By 1979, the number of such installations had risen to 110 (excluding micros).[9] The most recent survey estimates that there are now more than 635 (including micros) of such installations.[10] There has thus been a phenomenal increase in the number of computer installations in Nigeria particularly during the period since 1979. One reason for this was, of course, the availability in larger numbers of comparatively low-priced micros as well as the successful sales drives of a variety of computer bureaux and vendors during the period. One other reason is the

increase in the areas of applications ranging from areas of government planning, matters relating to national security and statistics, accounting and administrative procedures, research (particularly in pure and applied science), banking and finance and market research. However, the overwhelming majority of these installations are for business applications and the point has been made repeatedly that most of the applications are not sophisticated ones.[11]

One other significant factor in the local computer marketing and installation scene is the increasing proliferation of computer brands.[12] Although this is perhaps a faithful reflection of the larger world-wide computer market scene, it is nevertheless significant, considering the relatively small size of the Nigerian market. Furthermore this may, if unchecked, complicate attempts at standardization and cooperation in areas where these may be attempted in future.

Finally, because the market grew so quickly over a relatively short time-span it has not had the opportunity to develop the required expertise in hard- and soft-ware maintenance and related operations.[13] It has also attracted a number of vendors whose interests do not go beyond selling the equipment and whose activities have spelled the doom of many a computerization project.[14] Nevertheless, there are now 14 Colleges and Universities offering standard degree and Technical Certificate courses in Computer Science together with a number of computer firms offering courses at lower levels in Computer Programming and Systems analysis.[15]

Mention should also be made here, however briefly, of the gradual improvement in telecommunication facilities. Although the state of internal communications: road, rail, postal and telephone services, still leaves a lot to be desired, there has been significant improvements in external telecommunications via satellite earth stations. If the improvements can be sustained, it does offer great possibilities for developing the capability for on-line access of the data bases of the developed world, as suggested earlier.

The impact of the computer revolution on library and information services in Great Britain and the United States of America was not lost on Nigerian librarians of the early 1970s who have always had access to the library literature of those countries. Some of them were also trained in those countries and had some exposure to courses on information science. This interest soon became manifest in the activities of the Nigerian Library Association. At the Association's Annual Conference in 1970, a leading Nigerian mathematician, Professor Iya Abubakar was invited to deliver the Annual Lecture on Library and the Computer.[16] He warned his audience not to rush into computerization on the "emotional", if understandable, notion that "computers are modern and efficient, and therefore a library which uses them must necessarily be efficient and progressive."[17] According to him, libraries should embark on computerization only when "the volume of work justifies the use of a computer, and ... computerization will necessarily enhance the efficiency of the library without increasing the proportional costs."[18] Consequently he concluded that automation should be economically justifiable only in large labraries or in cases where a number of small libraries combine together to form one large unit for processing purposes. Nevertheless he predicted a future where relatively small libraries may find it cheaper to employ fewer human beings and use the computer because of a predicted drop in the cost of computers, their wider availability and the rise in the cost of labour. This lecture no doubt had an impact on Professor Abubakar's audience at the time and it was followed by a workshop on computer applications held at Ibadan in 1972 and co-sponsored by the Association of Special Libraries (ASLIB) London, and the Department of Library Studies, University of Ibadan.[19] Also in 1977 a workshop on library automation in Nigerian University libraries was organised at the University of Ibadan by the Committee of University Librarians. Its aim was "to educate librarians on the potential uses of

the computer for library purposes - both on individual and co-operative bases"[20]. And in 1982 a Training Course on computerized information and documentation systems was jointly organized in Lagos by the Federal Institute of Industrial Research Oshodi (FIIRO) and the Department of Computer Science of the University of Lagos.

This growing interest in computerization was also reflected in the issues of Nigerian Libraries, publication of the Nigerian Library Association particularly in the years 1976-78.[21] On the whole, these activities signified an interest in computerization during this period although much of the interest was limited to librarians in the National and University libraries, and later a few large special libraries. One reason for this was the relatively large scale of their operations. Furthermore, the University libraries had the additional incentive of having on their campuses Computer Centres to which these libraries turned for assistance in their computerization efforts. As for the National Library of Nigeria it sought, in computerization, avenues for enlarging its role as the national centre for bibliographic information.

V

University of Ibadan

The objective of the University of Ibadan library project was to computerize its Serials Catalogue. Later it sought to produce a Union List of Serials. The library serves Nigeria's oldest University which was established in 1948 and has the richest collection of learned journals and research materials. By January 1966 the University had established a Computer Centre equipped with an IBM 370/135 Computer.

Because of the size of the library's Serials collection the production and up-dating of its serials catalogue was proving increasingly expensive and time-consuming using the mimeographic and later photo-lithographic methods.[22]

From April 1973 therefore the library opened discussions with the Computing Centre on the possibilities of using computer facilities. The Computing Centre was responsible for preparing a programme and processing the data submitted on work-sheets by the University library, using the batch mode. It took over two years to complete work on the Serials Catalogue. The delay was partly due to the low priority attached to the project by the Computing Centre such that the "library programme was invariably suspended each time there was what seemed, to the Centre, more urgent requests from other quarters."[23] Other factors responsible for the delay included staff changes in both the library and the Computing Centre and a programming omission which made it impossible to derive a simple listing by titles and holdings because the library had not indicated this at the time the programme was being prepared!

More problems were encountered with the preparation of the Union List of Serials which was started in 1976. The objective was to produce a computerised Union list of serial holdings of all major University and Special libraries. Since 1977 the project had been hit by the financial crisis being experienced by the University. Also the main computer broke down over a long period and there were no funds to purchase the necessary spare parts. To add these, about 50% of the coded cards were damaged by flood where it was stored. Up to the time of writing the completed Union List of Serials is still being awaited.

University of Lagos Circulation Project

Plans for the University's computerized circulation system started in 1975 following the visit of technical advisers from the Inter-University Council in Great Britain. The plan recommended was for the creation of a computer master file of all loanable library material using the punch-card batch mode. Data processing was to be carried out in the University Computer Centre equipped with an IBM 370/145. The equipment selected for the circulation system was the Plessey Light Pen Automated Library which was

finally installed in September 1982, tested, commissioned and switched off and has not functioned again since. Among the many problems experienced inexecuting the project were delays in transferring data from input forms to punch cards at the Computer Centre, technical difficulties in recent years in the out-moded method of transferring data from punched cards to computer discs due to changes in technology, and shortage of funds which has made it even impossible to acquire all the equipments needed. Also because of the long delay in executing the project there has been several staff changes in the library which has in turn resulted in further delays and difficulties. Worst of all, the suppliers of the Circulation System hardware, Plessey, had changed their line of business and are therefore no longer interested in the project. It now seems likely that there would be a complete change of plans and equipments if the project is ever to be continued.

National Library of Nigeria[24]

The National Library of Nigeria was established in 1964. Its responsibilities include the maintenance of the national bibliography and a national union catalogue of books and serials. The Library's computerization effort started in 1976 with a feasibility study undertaken for it by the IBM Nigeria Limited which recommended the IBM System/3 Model 10 for the computerization of the library's Cataloguing, Circulation Control, Serials and Acquisitions. This initiative appears to have been taken before the necessary preliminary steps of systems study etc. and no steps were taken to implement the recommendations.

From 1977, the library's attention shifted to the British Library Bibliographic Services Division for the possible use of the library's BLAISE programme to get on-line access to the British Library and the Library of Congress MARC files and the LSP software for handling the records, creating local files and producing local output.[25]

The British Library was also supposed to provide training for relevant National Library staff in on-line interrogation and edit techniques and assist in the choice and installation of equipment. The National Library was required to instal an IBM teletype Compatible Terminal with dialing facilities for data transmission between Lagos and the British Library computer systems in Harlow. By June 1978 however, this proposal became inoperable when it became clear that datel communications were non-existent between Lagos and the United Kingdom.

Finally, in 1979 the National Library acquired the INFOREX key to disc data capture equipment consisting of a Disc system with a 16k processor, 10 video keystations and Printers. The plan was to use the equipment for in-house data storage while the processing was done on the main-frame of a computer bureau. Among the data requiring such storage are those of the National Union Catalogue now far in excess of 700,000 which have been proving unmanageable using manual methods.[26] Others include the National Union List of Serials (NULOS), the International Serials Data Centre (ISDC) and the Inter-library Lending data.

However this latest strategy has been completely grounded by the incessant breakdown of the data capture equipment and the library now intends to seek other means of implementing the projects in a current review being undertaken.

Federal Institute of Industrial Research, Oshodi (FIIRO)

The Federal Institute of Industrial Research Oshodi (FIIRO) was established in 1956 to assist and accelerate the industrialization of the Nigerian economy. Among its current objectives is the establishment of a national industrial information centre with the assistance of the United Nations Industrial Development Organization (UNIDO). The Centre is expected to have an industrial information data bank with telecommunication and

computer facilities that will give the Institute and Nigeria as a whole direct access to the technological data banks in the advanced countries. An essentially exploratory Phase I of the project was started in 1978 and has now been completed. Under Phase II of the project, an industrial information expert will be sent from UNIDO which will also provide a Mini Computer expected to be either HP 3000 or PDP 1170. Meanwhile, as a stop-gap measure, the library has since 1984 acquired a SIRIUS I 128k microcomputer with a CARDBOX software for library management and WORDSTAR software for wordprocessing. These are being used for such applications as the indexing, storage and retrieval of press clippings, the generation of a serials list and the compilation of Institute's nominal roll.

International Institute of Tropical Agriculture, Ibadan (IITA)

The International Institute of Tropical Agriculture is part of a chain of similar institutes world-wide engaged in research on various aspects of tropical agriculture. The Ibadan institute's area of specialization is grain legumes and it derives its funds from external sources. The Institute is equipped with modern facilities including an efficient central computer facilities. Its library has a reputation for being as modern and efficient in its procedures and operations as any in any other part of the world.

Part of the library's responsibilities has been to serve as a grain legume information centre in collaboration with the International Development Research Centre (IDRC) in Ottawa, Canada. The library also has a reputable yam information services. From 1974 the library adopted the punch card technology, the Termatrex system, for its information storage and retrieval on all aspects of grain legumes and yam. Since 1985, however, the library has been fully computerized following the acquisition, in 1984, of the BASIS software. The library's operation is hooked up to the

Institute's VAX 11/750 mini computer. The fully integrated programme covers the entire Catalogue, Acquisitions and Circulation records and an SDI Service. The system also provides personnel records and a mailing list of 5,000 addresses. There are provisions for five terminals within the library area. This is the first operational fully integrated computerized library and documentation service in Nigeria and one of the most remarkable things about it is the speed and smoothness of its execution. The only problem experienced so far, according to the library's Director, is that there is need for more terminals for library users in the present system.

The Nigerian Institute of International Affairs (NIIA)

The Nigerian Institute of International Affairs was founded in 1961. Its main objective is to promote research and disseminate information on international affairs. It maintains a well-appointed library with a rich collection of relevant books and journals. One of the unique features of that library is a large Press Library whose resources include a press clipping collection now numbering over 100,000 items. It is a depository for ECOWAS and OAU documents and for the texts of Nigeria's treaties and agreements. Its indexing and documentation activities include the publication of a documentary source on Nigerian foreign affairs and a current awareness bulletin.

The decision to computerize the library's information service followed the acquisition of a Radio Shack TRS 80 II micro-computer by the authorities of the Institute which felt convinced that it would be useful for library and word-processing applications and over-ruled the library's preferred step-by-step approach to computerization.[27]

After overcoming its initial misgivings, the Library has now presented a proposal of computerization in two phases. In the current first phase,

it is planned to use the microcomputer which has now been installed for limited data base management and word processing applications. Consequently orders have been placed for the SCI-MATE software for data base management and the SCRIPSIT software for word-processing. During this phase efforts are also being made to make the library staff more knowledgeable about the use of the computer through visits, lectures and workshops. Meanwhile, plans for the second phase are also proceeding. Plans are being made for feasibility report to be prepared by a consultant. The ultimate objective will be to put in place an integrated system covering the cataloguing, acquisitions and circulation records and an SDI service, with future on-line networking capability.

VI

The problems encountered in cases of computerization in areas similar to the ones discussed above have been exhaustively discussed in the literature on the subject.[28] In spite of the trend, already mentioned, of a sharp drop in the cost of hard-ware, these equipment are still very expensive items in Nigeria, partly because they attract high import duties and also because of the exploitative practices of many local vendors. Besides, computer installations in Nigeria have to include such extras as emergency power generating sets and uninterruptible power supply (UPS) packages to cope with the problem of power fluctuations and interruption. Funding is thus a problem.

There are also myriads of technical problems ranging from inadequate (though improving) telecommunication infrastructure,[29] to erratic power supply, to frequent equipment (particularly main-frame) malfunction and long delays in effecting repairs. In some cases these have resulted in total failure and equipment obsolescence.[30]

Finally and, in this writer's view, most crucial of all, there are problems related to manpower resources. Most Nigerian librarians have

on the whole shown a lack of familiarity with computer use in library and information work inspite of thelectures, seminars and workshops to which reference has been made. This is due, in this writer's view, to inadequate or total lack of hands-on experience with computers. This lack of in-depth knowledge and experience then manifests itself as either lukewarmness or total hostility to the idea of automation. It has also sometimes resulted in poor judgement in the choice of automation approaches and equipment.[31]

The nature of the computer market in Nigeria also constitutes a problem to libraries planning to computerize their services. Apart from being exploitative, it does not have adequate trained manpower for project design and implementation as well as for providing back-up services.

Also, it is probably fair to say that in the cases, especially among University libraries, where the assistance of Computer Centres have been sought in implementing automation projects such projects have been accorded relatively low priority over the various other demands of their academic communities. Those pursuing their computerization projects in this way would do well to recognise this potential problem.

Finally, the cases studied above reveal a number of shortcomings in project implementation. Of particular note is the apparent lack of decisiveness on the part of the decision makers and the shifts and changes in the decisions taken. This suggests a lack of sufficient grasp of the subject. In contrast it is instructive that the successful story of the IITA computerization was characterized by a remarkable speed of execution. The projects therefore tended to drag on excessively, resulting in equipment deterioration and, in some cases, obsolescence and also staff changes and instability.

Taken as a whole, not much progress has been made towards harnessing the benefits of the computer revolution in library and information services in Nigeria. Yet the future of these services lies in such a course.

The signs are that the initiative will, in the coming years, pass from the University libraries to the large research and special libraries because of the latter's narrower and more easily focused objectives and their greater appreciation of speed, accuracy and efficiency for which the computer is noted. For Nigeria as a whole, however, the way forward lies in finding solutions to some of the technical, financial and manpower problems noted above in a scheme of cooperation and collaboration at national and international levels. The overall objective should be to achieve a reduction in the present cost of computerization to individual libraries and wide diffusion of computer literacy among the various levels of staff in libraries and information services.

At the national level, the library association, the NationalLibrary, library and information science institutions and the major libraries planning to computerize should establish a platform for collaboration such as through the establishment of a Committee on Library Automation.[32] The Committee should, with government support, conduct studies, collate and disseminate relevant information on library automation. It should, with a view to ensuring economies of costs and efforts, establish standards and priorities for library automation and cooperation and coordinate automation activities. Finally it should provide funding for automation projects. Greater efforts should be put into training and education to provide an informed high level manpower able to take crucial decisions in the rapidly developing area of computer technology, as well as a computer literate supportive staff. In this connection, the Nigerian Library Association, the schools of library and information science and the National Library are urged to continue to conduct workshops on a planned basis and produce training manuals.

At the international level the proposals, now at an advanced stage, to establish an African Regional Centre for Information Science (ARCIS) at the University of Ibadan is warmly welcomed. It is noted that among its objectives is to "train and retrain high-level personnel for Africa in

information science essentially through seminars, workshops and higher degree programmes ... (and) serve as a reservoir for consultants in information science to African governments and institutions ..."[33] Mention should also be made of the integrative role expected to be performed by the Pan African Documentation and Information System (PADIS) in Addis Ababa, inaugurated in 1981 and conceived as "a coordinated network of collaborating national and sub-regional information systems or participating centres within the African continent."[34]

On the whole, it is hoped that the "information rich" countries will do all in their power to assist Nigeria and other "information poor" countries to develop the capability for mutually beneficial information exchanges through networking.[35] Bodies such as IFLA, UNESCO, FID and IDRC are in a position to assist in such areas as consultancy services and training.

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12. Nevertheless the leading brands in the mainframe and mini categories are IBM, ICL, DEC and WANG (Source: The Nigerian Computer Users Directory).

13. The Nigerian Computer Users Directory lists 66 computer vendors.

14. Apart from poor support and maintenance services, local retail prices are usually excessively expensive.

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17. Abubakar Op. cit. P.103

18. Ibid.

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20. See Nigerian Libraries 13 (1-3) 1977 for papers presented at the workshop.

21. Apart from vol.13(1-3) 1977 devoted entirely to the subject, see also AKINYOTU, A (1976) Op.cit and LAWANI, S.M. (1978) Modern technology and library services. Nigerian Libraries 14 (1-3): 37 - 61.

22. For a detailed discussion see ARAMIDE, F.O. Compiling a computerised Union List of Serials: the Ibadan experience.

Paper presented at the Training Course in computerised information and documentation systems, 18-22 Jan. 1982.

23. Ibid.

24. I am grateful to the Director of the National Library of Nigeria, Mr. M.H. Wali for the information used in writing this section of the paper.

25. cf. Anderson. Op cit. p.288 for a similar strategy used by the National Library of Singapore which also used BL's BLAISE and its Selective Record Service.

26. See Bankole, B.S. Op.cit.

27. The Director of Library had suggested that the acquisition of hard-ware should be preceded by a feasibility study by a competent Consultant and a well-articulated programme of implementation.

28. See ADEYEMI (1986) Op.cit, ANDERSON (1983) Op.cit and IGWE, P.O.E. (1986) The electronic age and libraries: present problems and future prospects. International Library Review 18(1) : 75 - 84

29. We have seen how this finally wrecked the National Library of Nigeria's planned on-line arrangement with the British Library.

30. This was the case with the National Library's INFOREX equipment and the University of Lagos' Plessey Light Pen Automated Library.

31. For instance, in spite of the wide availability of inexpensive off-the-shelf software packages most librarians here still instinctively commission expensive and time-consuming home-made programmes.

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IFLA GENERAL CONFERENCE, TOKYO

1986

Division: Special Libraries

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THE INFORMATION ACTIVITIES OF THE NATIONAL LIBRARY OF ECONOMICS IN THE FEDERAL REPUBLIC OF GERMANY

Transition from traditional library services to computer-based information systems

by

Ekkehart SEUSING

Library of the Kiel Institute of World Economics - National Library of Economics in the FRG
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The Library of the Kiel Institute of World Economics - since 1966 National Library of Economics (NLE) in the Federal Republic of Germany - is financed by the Federal Department of Commerce and the eleven Federal states. The new program "Specialized Subject Information", initiated by the German Federal Government plans to increase its bibliographic services of economic information by implementing new techniques on the national and international level, specifically in the following areas of the NLE[1]:

- Bibliographical data bases in macro-economics,

- bibliographical data bases in business administration

- general current economic informations and basic orientation on economic growth and development at home and abroad,

- selected informations on enterprises, e.g. financial statements, business records; bibliographical data on products and industries at home and abroad.

Taking these points into consideration, the effect of the implementation of automated data processing (ADP) in the NLE should be examined. Special emphasis is placed on structure and size of current information services.

At first these services are presented. Then a short description

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of the hardware and software is given. In the third chapter their effects on information services by the library are discussed.

1 Supraregional information services

Worldwide, the NLE has developed into one of the largest and most famous libraries for economic literature. Being a central library, it has a nationwide function to collect, classify, index, and to lend the economic literature from all countries and in all languages to its users.

First of all some indicators are mentioned, to shed light on the requirements for the ADP-system (table 1): Library holdings amount to 1.7 million bibliographic units; the annual addition in 1985 comes to roughly 54.000 documentation units; 12.382 annuals, 5.625 journals, and 59 newspapers were processed. Regularly articles of about 2.000 journals are indexed, 110 of them are indexed cover-to-cover. More than 10.000 articles are indexed in composite works (e.g. conference volumes, Festschriften). The library holdings are used in different ways. Refer to the data in table 2 as these information services are discussed.

1.1 Bibliographies

The most extensive service is offered by the American publisher G.K.Hall & Co. through the publication of the catalogues of the NLE in book form. From 1966 to 1968 the complete collection of catalogue cards at that time was filmed and published in 207 vo-

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lumes. These volumes can be consulted in many libraries; in Japanese libraries, too, as far as we know through interlibrary loans.

Since 1968 the NLE edits the "Bibliographie der Wirtschaftswissenschaften" (Bibliography of Economics) subsidized by the German Research Council. Two semi-annual volumes containing 20.000 titles are published, selected from the annual addition of roughly 54.000 bibliographic units. Bibliographies concerning special economic subjects are published in the series "Kieler Schrifttumskunden zu Wirtschaft und Geseilschaft" (Kiel Bibliographies of Economics and Society).

1.2 Reference work

Upon written request the staff of the information department selects relevant titles from specialized catalogues. A search can be done by subject, region, and/or time period; the economic thesaurus developed for the library serves as basis for a search. On the average twenty titles are provided to the person requesting a bibliography. The selected catalogue cards are photocopied and sent to the user.

Upon request photocopies of publications, especially of articles in journals and annuals are provided. The library adheres to the copyright law and is reimbursed for its expenses.

1.3 Economic archives

The question is forwarded to our archives, if it is impossible to find references pertaining to current issues (e.g. current

economic or business policy), as the events are reflected in journals or books with a time lag. Since 1920 the archives collect newspaper clippings regarding economic and social problems. More than nine million clippings - systematically arranged by subject, region, and time period - are available. For external users, relevant clippings are photocopied and mailed.

1.4 Individual search profiles

Selective dissemination of information - also called Kiel Card Service (KCS) - resulted from the idea of Knut Borchardt in 1960 to make available "the Kiel inventory of catalogue cards by increasing their production and sending them out" to other libraries[2]. The starting point for this activity is the comprehensive collection of the NLE. Smaller libraries can have access to the catalogue card service and the services of a large library and information center. Besides fulfilling its basic functions the library offers extensive indexing of journals, annuals, and composite works.

The share of grey literature amounts to roughly 60 percent of the holdings. The same criteria are applied to these publications as to conventional publications, which requires a substantial effort that smaller libraries - usually understaffed - cannot afford. The acquisition of grey literature is of great importance, because the most recent results of research are published at first in working papers, reports, etc.

The selection is mostly made by subjects, regions, or a combination of both. Participating libraries receive complete and up-

to-date information about the latest literature on any subject area. Twenty percent of the users request bibliographic citations of articles in journals. This reflects the traditional documentation activities of the NLE.

2 Automation of the NLE

The purpose of automation is the creation of compiete and up-to-date bibliographic data in the field of economics. Of central concern is the adaptation of information services to national and international demand.

In addition to the continuation of the previous activities it is planned to intensify participation on the European information market. Users of many data bases have problems in borrowing the publications cited in bibliographies. These difficulties have been recognized by information suppliers. Hosts that are not able to provide document delivery systems on their own try to collaborate with libraries that are efficient and collect on a worldwide basis.

In contrast to other data bases the NLE only offers bibliographic data of publications, that are actually available in its collection. The library achieves a significant competitive advantage by providing the literature either through interlibrary loans or through photocopies.

2.1 Progressive introduction of ADP

In the beginning of 1986 automation of the descriptive catalogu-

ing department began after completing a test at the end of 1985. Intensive in-service training was necessary, because the rules for descriptive cataloguing were changed at the same time ADP was introduced. The German Rules of Descriptive Cataloguing for Academic Libraries form the basis of data exchange on national and international levels. These special rules allow additional secondary entries, cross references and entries for activities of the NLE relating to the field of documentation.
When sufficient time following of adoption of the cataloguing system has elapsed, the bibliographies and selective dissemination of information will be integrated in the automation effort.

Then the implementation of the next development stages will begin: From the integration of the acquisition department to the implementation of online services and videotex for ECONIS (Economics Information System).

During the transitional phase of about five years the conventional card catalogues will be continued and the user will be able to search as before. Ultimately the fast growing data base will be the only available search medium.

2.2 Selection of hardware and software

Close cooperation was realized to introduce ADP between the library and the Computing Center Schleswig-Holstein, a public corporation. For data processing and data storage the Center puts a host computer Siemens 7.570 at the disposal of the library.
The terminals of the library are connected with it via a Siemens

7530-D (equipped with four MB main storage) installed in the NLE and two integrated front end network processors. At the moment 35 terminals, mostly Siemens 9755, are used. Seven terminals (Siemens 9751-30) have an extended set of 128 characters necessary for East- and non-European languages as well as for proof reading.

System descriptions, progress reports by other libraries and our own tests resulted in the decision to apply the software system IBAS III (Information system of descretionary implementation structures). This system is also introduced by the State library systems of Hamburg, Berlin, Northrhine-Westphalia, and Baden-Württemberg. During the test period it became obvious, that some of the functions characteristic of documentation and information activities of the NLE must still be integrated in the basic system.

3 ADP-aided information system

By using ADP, information supply will be further improved and international division of labour concerning the information sector will be intensified. So far, the NLE is cooperating with the System for Information on Grey Literature produced in Europe (SIGLE) and with the "International Bibliography of the Social Sciences - International Bibliography of Economics". In the long run coordination is aspired by exchanging our bibliographic data with information of other data bases.

The supply of online searches through information brokers (like public libraries) will presumably cause a change of demand, as far as the present information services of the NLE is concerned. It has not yet been decided, which host will distribute the Kiel data base. The final decision will be made, when the number of citations is large enough to ensure a successful online search by users.

3.1 Bibliographies

The "Bibliography of Economics" will be compiled automatically through special classification codes. The bibliography could include the total number of records added to the library instead of the selection of 20.000 titles per year, as has been the practice until now. It could also be published several times a year. Computerized production will greatly simplify the publication of cumulative indexes.

In collaboration with the publisher of the bibliography the library undertook a questionnaire survey in June 1986. The enquiry should provide answers to questions concerning selection criteria about size, content, and language, or the structure of the classification. Furthermore, it should be investigated, if it is necessary to have a printed edition supplementing microfiche and online. The survey has not yet been evaluated.

More special bibliographies than before will be published in the series "Kiel Bibliographies of Economics and Society". They can be produced in printed as well as in machine-readable form. It

is planned to offer bibliographies of topical subjects upon request and payment.

3.2 Information Retrieval

Starting with online searches at the beginning of this year, a steadily growing percentage of information will be searched in the data base. That means - depending on the question - for years to come part of the bibliographic data will be composed of results of manual and online searches. This will be necessary since the existing collection of 8.5 million catalogue cards cannot be converted to a data base because of costs.

Online searching will improve search results through the combination of search criteria of content and form. It will be possible to link descriptors, key words and headings. The search can be specified by geographic terms, by time period, and/or other formal search criteria. The last mentioned can be related to contents (bibliographies, statistics) or to form (government publications, grey literature), or other aspects (loose-leaf, wall maps). Furthermore it is possible to differentiate by country of publication, by publisher, and/or the language of publication. With numerous access points the software ensures a more selective and quicker search than it is possible with traditional card catalogues.

3.3 Selective dissemination of information

To obtain better information concerning the needs of customers, a questionnaire survey was conducted in January 1985. Some questions related to the required output medium following introduction of ADP. Without taking costs into consideration, libraries were asked to choose the medium most suitable for them. The opinion survey[3], surprisingly, showed that 54 p.c of the libraries will remain users of the Kiel Card Service - in the true sense of the word (table 3).

This statement must be qualified by investigating the number of catalogue cards that were delivered to those libraries in 1984. The investigation revealed that in the future only 35 p.c. of the catalogue cards must be printed. This percentage may drop to 13 p.c., because some customers have not yet decided, if they want to continue with catalogue cards or other mediums.

About 20 p.c. of the libraries are interested in COM (Computer Output on Microfiche), especially in cumulated editions. 18 p.c. of the present customers of the Kiel Card Service would like to take printed lists and 8 p.c. magnetic tapes.

The opinion survey did not provide unambiguous responses. The available technical equipment of the particular library is of great importance for the decision, which medium will ultimately be used and cannot be answered definitely at the moment. The demand is also influenced by future prices of the Kiel Card Service.

The system of central cataloguing service for other libraries will be considerably simplified by introducing ADP. Selective

dissemination of information will be controlled by customer profiles storing the names and addresses, search profiles, the chosen medium, and the specified time of delivery. It will be possible to combine search criteria for content and form as well as additional access points (see part 3.2).

As far as microfiche is concerned, cumulated editions and COM-generated indexes are planned, i.e. an alphabetically arranged index (main entry, keywords and geographic regions). Magnetic tapes contain complete entries with all references and linked entries.
In addition, printed lists are offered - cumulated and sorted as needed by the customer.

3.4 Online searches

Some customers of the KCS are interested in online use of the data base. This corresponds with the intentions and plans of the NLE. The data base will be released for general online use, when the input is large enough to ensure successful searches. Then very specialized libraries can participate, too. It has not been worthwhile for them to order catalogue cards due to limited demand of economic literature. This concerns above all public and administrative libraries, or industrial customers.

US-American experiences show that the percentage of printed information services will be reduced by offering online data bases[4]; partly this is also caused by the fact that the general use of computers and data bases will become a daily expe-

rience. In future years intensified online use of the data base can be expected, based on improved technical equipment even for smaller special libraries. Different intended uses of searches demand different ways of searching. Printed services can be included in a preliminary search to estimate the result of an online search and its costs; i.e. online data bases may complement printed services but not replace them.

3.5 Optical disks

Two publishers have made an offer to transfer the complete collection of catalogue cards on microfiche following discontinuation of the traditional catalogues on the NLE. The microfiche collection will be marketed worldwide. But according to the impressive technical progress in the optical disk sphere it has to be considered if the existing collection of 8.5 million non-machine readable catalogue cards should be transferred on optical disks (CD-ROM). In spite of the present high costs, the optical disk is extremely suitable for offering conventional catalogues, when the library converts to online catalogues[5].

Application for optical disks will broaden in future years[6], even if the intermediary experience of libraries are not yet known. The audiovisual media centre of the University of Essen has carried out a laser disk pilot project, without having any widespread effect.

The project of the publishing house Gruner and Jahr (Hamburg) has been more successful in storing its archives of eight million pages on DOR (Digital optical recording)-disks. Implementing

the Philips-system Megadoc, by 1987 four million pages will be stored on 220 DOR-disks and will always be available on video terminals.

The Technical Information Library (Hannover) has made cost estimates of storing the annual expansion of its journals (100.000 copies) on DOR-disks and of copying them. They came to the conclusion that the current costs will amount to 1,7 million DM per year, not including basic equipment of 3,1 million DM.

In the UK and the Netherlands pilot projects are being promoted. Intermediate results indicate that the CD-ROM will be a most important innovation in librarianship. The advantage can be seen in memory capacity: The CM-100 disk by Philips has a capacity of 600 MB, corresponding to about 120.000 DIN-A-4-pages.

The impressive development of optical disks will continue in future years. In the future this medium will play a more and more important role in spite of partly unsolved technical problems and - at present - comparatively high costs for the production of the master disk.

4 Outlook

In the Federal Republic of Germany in general and in the NLE in particular up to now the necessity to improve the supply of economic informations by implementing ADP did not exist, because the NLE could meet the demand in the past with its traditional catalogue system. Regular indexing of about 2.000 journals, and indexing of articles in composite works, as well as the conven-

tional collection more than 8.5 million catalogue cards are unique among special libraries in economics. The positive national condition - without ADP - had the negative consequence that the position of German information delivery was no longer competitive on the international market without online searches.

To reach a high degree of excellence, a central special library must enable its users from university and industry to spend as little time as possible on searching. By implementing selective dissemination of information services, online searches, and an international division of labour, information will be distributed all over the world. The NLE promotes internationalization of information supply. Because of this, it will no longer be possible to offer top grade informations free of charge.

Prompt supply in the document delivery system constitutes an additional incentive for the NLE information services besides the high standard of information retrieval. The steadily growing demand of non-conventional literature favours the development of networks between information system and libraries. A document delivery system will supplement bibliographical data: a demand the NLE has realized for decades.

Telecommunication costs will become a substantial part for competition in the delivery of online services. Poor telecommunication services - compared with the USA and Japan - and high costs in Western Europe contribute to additional costs for searches and information[7]. One result could be a distortion of competition for European data bases among one another and in competition

with third countries. The small size of telecommunication markets in the EC gives cause for concern that these countries could be at a disadvantage with the USA and Japan in competition on the information market.

Implementation of ADP in the different departments of the NLE (library, documentation, and information) will increase and improve services on all levels.

Notes

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Table 1 - Holdings of the National Library of Economics (1982-1985)

Type of holdings	1982	1983	1984	1985
Books (bibliographical units)	1 537 607	1 575 485	1 615 555	1 655 650
Journals	18 730	18 375	17 987	18 066
Annual addition (documentation units)	55 155	57 779	56 038	53 626
Catalogue cards	7 626 380	7 905 657	8 185 333	8 452 627

Source: Bibliothek des Instituts für Weltwirtschaft an der Universität Kiel/Zentralbibliothek der Wirtschaftswissenschaften in der Bundesrepublik Deutschland, Statistische Übersichten für das Jahr ... , Kiel, current volumes.

Table 2 - Users fo the National Library of Economics (1982-1985)

Type of user	1982	1983	1984	1985
Lending activities				
- interlibrary loans	31 067	30 813	31 657	33 314
- local lending	95 745	89 367	105 254	112 827
Bibliographical searches on written request	1 812	2 021	2 334	2 636
- quantity of bibliographical information	36 308	36 404	35 930	42 150
Selective dissemination of information	96	93	93	97
- quantity of bibliographical information	554 732	566 889	561 597	513 876

Source: See table 1.

Table 3 - Mediums of output as chosen by the users of the Kiel Card Service when introducing ADP at the National Library of Economics (1985)

Users of the Kiel Card Service	Mediums of output when introducing ADP at the National Library of Economics			
	catalogue cards	micro-fiches	magnetic tapes	printed lists
Departmental and faculty libraries of universities	31	10	4	6
Special libraries in economics	12	6	2	3
Libraries of regional orientated institutes	14	4	2	2
other special libraries	5	-	-	1
University libraries	2	4	1	1
Research institutes and organizations outside universities	13	6	3	6
Libraries of institutes	3	1	1	3
Professional information brokers	5	-	1	1
Libraries of enterprises	3	1	-	1
Individuals and others	10	1	-	6
Total (104)	56	21	8	19

Multiple answers were possible per user.

Source : See Note 3.

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Library automation activities at Helsinki School of Economics library and in Finland

by

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LIBRARY AUTOMATION ACTIVITIES AT HELSINKI SCHOOL OF ECONOMICS LIBRARY AND IN FINLAND

Computers and electronic data processing have been used in libraries already more than 20 years. Nowadays computer applications for various library functions are numerous, however, really integrated systems are very few. Medium-sized libraries have not had many possibilities for selection when wanting to use an integrated library system. This year 1986 there has been an international bidding competition for an integrated online system for research libraries for Finland. The IBM's Dobis-Libis and University of Guelph's GEAC were offered as well as Virginia Tech library system from USA and HELECON [1] from Helsinki School of Economics Library

BACKGROUND INFORMATION:

Helsinki School of Economics Library (HSE) was established 75 years ago. The school has 4000 students of undergraduate, graduate and doctoral levels. The statistics of the library give an overview of its size and functions: 220,000 books, 1,600 journals, 3,500 series, 6 databases, 2 index journals and numerous other publications. Being a specialized library because of the subject area - economics and business sciences - it is as well a public library in that it is open to all interested persons in the country. Since 1977 it has been a national central library for economics and business with obligations for not only the normal library functions but also information retrieval and data collection in its area. It participates in various national and international networks and provides 6 databanks. The HSE is also an active participant in making various resource sharing networks in an old Scandinavian tradition.

TECHNIQUES:

Technical resources for the library are rather good, because as a first library in whole Scandinavia it got its own computer in October 1984. Electronic data processing has been used by the HSE library for the past 20 years as the first Union catalogue of economic periodicals was published in 1966. Getting a computer for library usage only has given

considerable possibilities for increasing and enlarging the activities. The computer is a Hewlett Packard 3000/42, i.e. a medium-sized computer with a storage of 2 megabytes, a disc space of 800 MB and maximum number of simultaneous users 40. The HP 3000 is connected with the national physical network called DATAPAK (each of the Scandinavian countries has its own national PTT run network called DATAPAK but they are fully independent from each other). HSE's HP is also connected with international networks like European DIANE and TYMNET.

In the integrated HELECON system there are three data files:
- thesaurus database
- reference database
- lending database.

Thesaurus includes fixed keywords in Finnish and English, and UDC (Universal Decimal Classification) numbers for classification. In the reference database is the actual information about the publications and in the lending data base information about publications, customers and storage. These functions belong to a HELECON subsystem called BILD [2] (Bibliographic index of library documents).

USE OF ADP:

Each library whatever its subject area or size is, has the so-called household activities, by which I mean acquisition, cataloguing, classification, budget control, or lending.

Acquisition was the first function of the BILD system started in 1980. The request is put into the system and the program checks automatically whether the book does exist already in the system or has been ordered. Also the supplier is indicated as well as number of copies, price, budget group and possible comments. As a result we get various lists/order cards for the bookstores and letters for individual requests. It is possible to make reminder lists for books which have not arrived in expected time. The system will - we hope in the near future - be connected with that of a local bookstore (Academic bookstore), one of the largest and best equipped in the whole Scandinavia. Still at the moment their online ordering has been available only with their own terminal and the speed of delivery has increased considerably.

Cataloguing and classification uses the information put in at the acquisition phase. It has various authority files like names of authors, or journals, or fixed keywords and UDC numbers. Catalogue cards are computer produced and for the time being still used in our library. The main reason has been that the library has a very large number of users and not enough terminals to be sure that customers will get speedy service needed. There are plans to stop the card production completely this year.

Budget control is possible for various budgeting groups. It indicates how much is reserved for each budgeting group for the period in question, how much has been used by the time of the inquiry, what is left, how many books have been acquired in this group, the average price and the finances still available.

Lending is the newest activity added to the HELECON system. The program is divided to two parts, one which the customer uses when searching what books there are, how to lend or reserve them, and another where the librarian registers the lending, returns and other related functions. The books are identified with barcodes and lightpens are used for reading. The lending system is this year in experimental use.

Searching and production of various publications belong to the service part of library activities. In HELECON system it is possible to make various publications based on datafiles, e.g. acquisition lists and SDI services.

Search elements are thesaurus keywords in Finnish or English, and UDC numbers in controlled thesaurus, author names, company names, names of series or journals, rough subject groups, language, freetext, or ISBN. Search is the oldest of the HELECON functions started already in 1976. It is possible to order article copies on-line and make search profiles for SDI service like in any larger system. Our cataloguers say it takes nowadays between 3 to 15 minutes to catalogue a book, a function which is supposed to be one of the basic and most important ones in all the library operations. As the system is shared by 3 libraries we can take advantage of the work of other participants. The union catalogue aspect is very important indeed in household

activities and even more important when making searches.

DATABASES:

Since many years the library has combined its functions with those of documentation and database production has been a very considerable part of its activities. At the moment there are six databases with ca 140.000 references and produced mainly together with other libraries of Scandinavian and European countries.

FINP, Finnish periodicals index in economics and business was the first database since 1975. A database of various levels' dissertations started since 1984 is called THES, Thesis of economics and business in Finland. These two are mainly of Finnish language materials and of national interest only. For the Scandinavian periodical articles and university series there is a database called SCANP, Scandinavian periodicals index in economics and business since 1977. For that we have participants in all Scandinavian countries from where the schools of economics libraries select and send their information. For the international materials there are three databases; SCIMP, European index of management periodicals since 1978, IBS, International bibliography of the social sciences, economics and sociology 1979-81 and BILD, Bibliographic index of library documents since 1980. SCIMP is produced by the European Business School Librarians' Group which has 14 members in 7 countries. It includes references to periodical articles with a strong European input. IBS is an experimental database produced by International Committee for Social Science Information and Documentation. The printed bibliography, which is probably well known to all of you, has existed since 1952 and the on-line experiment is to see what kind of usage the database might give. BILD contains acquisitions of 3 different economic libraries searchable in the same way as all the other databases, but it is also a "household" system where the system mentioned before is usable.

The annual references, ca 25,000 a year, are processed at Helsinki and put into our computer. We are one of the largest database producers as well as vendors in the whole Scandinavia. As all the databases are publicly available we have many users, not only in our country, but in other

Scandinavian and European countries. If you have accessibility to DIANE network in Europe or TYMNET in other parts of the world, it is possible to be connected with our databases.

EFFECTS OF COMPUTERIZATION:

The case study given here shows that it is possible also for a medium-sized library to utilize the powerful resources of computers to a rather great extent. They have had an effect on practically all the library functions; processing, service and personnel. We cannot brag that we would have diminished the personnel because of the system. That is not the government policy in our country and that is not the library policy. However, a change in the character and quality of the personnel is clear: we need more highly qualified, specialized persons, documentalists and information managers. We have received with automation better and quicker service for customers, and an enlarged number of international clients.

The example shows that it is possible to make an integrated library system for a medium-sized library. You don't have to be the big and the powerful in the world to achieve this. Also smaller countries, and smaller libraries can do that kind of thing. The system has been developed and experimented now over 10 years according to our needs. The library personnel and our customers are pleased with the system. What better recommendation could you give?

There is also the constant question of costs: How much ? It is very difficult to say even today, because the function has grown with the system. We need it to keep up with our services, we need it for our services. If we would not have it, we would have either double personnel or worse service. Libraries are seldom profit-making or even cost covering institutions. On the contrary, often they are one of the most expensive parts among the university's departments. However, with the help of the household matters combined with a search service available to the outsiders, it has been possible to make some revenue to the satisfaction not only of the library but also of the School of Economics. The prerequisite for doing that is to combine the work of a traditional library with that of a documentation center. And that is what we have

done.

LIBRARY AUTOMATION IN FINLAND

The use of automation to some library functions is quite common in Finnish research libraries. The results of the present bidding competition will be most important because of their effect on the whole automation development in the country. Until now perhaps the most remarkable standardizing factor has been the automated national bibliography for which 3 university libraries participate and which is online accessible.

The database creation is quite extensive. In Finland there are some 40 databases publicly accessible, among them several fulltext legal databases. The largest database producers in the country are in addition to HSE the State computer center and the Technical university library. The main bulk of the online users are still today the special libraries and company document centers according to a study made in 1984 [3], not so much the university connected research libraries. But the usage of online databases is increasing in both groups.

Finland is a small country with some 5 million inhabitants, some 40 university and research libraries with ca 13.6 million items in their bookstocks. These numbers are not very impressive internationally, and HSE is one of the medium-sized libraries in these surroundings. Yet we have a contribution to give to the international library community which is interested in the use of computers.

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Section: Social Science Libraries
1986 /

THE IMPACT OF OPTICAL DISC PUBLISHING ON THE INFORMATION COMMUNITY

(CD-ROM READ ONLY MEM)

by

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KEYWORDS:

CD-ROM (Compact Disc--Read Only Memory)
Optical discs
Online information retrieval
Database
Publishers
Libraries
Endusers
Hybrid systems

For internal use only: /
To be brought to meeting no: 130 /
Remarks: /
to be presented orally [X] /
for distribution only [ ] /

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Introduction

During the last few years librarians, information specialists and publishers have been confronted with the opportunities and challenges of a new and fascinating technology: CD-ROM (Compact disc -Read only memory). CD-ROM is a breakthrough in information storage technology. The first commercial products became available in 1985 and in mid-1986 some forty CD-ROM products are available to the library community. There is competition between the 12" videodisc and the 4.7" CD-ROM disc and some uncertainty as to which will ultimately become the preferred format.

However, there is strong evidence that the information industry is gravitating towards CD-ROM as the preferred medium for most applications. There is a strong feeling that CD-ROM has definite advantages with regard to standards and in economies of scale in the production of disc players and discs. The lack of standards for videodiscs and the higher costs of players and discs are seen as major drawbacks for videodisc systems.

This paper will provide a concise introduction to the CD-ROM technology. It will examine and emphasize the impact of CD-ROM on libraries, although there are many other applications in business, government and in the consumer market. It will examine the impact on publishers, the concerns they have and the challenges they face.

CD-ROM--The Technology

The technology for compact discs was developed during the last few years, initially for the distribution of music. The audio compact disc found such unprecedented acceptance in the consumer market that by 1985 millions of CD audio players had been purchased, becoming the most successful electronic consumer product ever launched.(1) The home entertainment industry invested enormous amounts of money into the development of compact discs and players. The information

industry is now reaping the benefits of these investments in the form of a manufacturing infrastructure for discs and drives and in the Philips/Sony world compact disc standard. (2)

CD-ROM provides a new medium for the mass production and distribution of information. Its particular strengths lie in the inexpensive way it can be reproduced once a master disc has been created, its extraordinary capacity of storing information and in the way this information can be read and retrieved.

A single compact disc of 120 mm in diameter can store over 500 Megabytes (MB) of information. That compares to the storage capability of 1,500 floppy discs or the equivalent of 200,000 pages of text. The digitized data is stored in microscopic pits that are burned into the master disc by a laser beam. The pits are then replicated as holes and flat surfaces pressed into the surface of each copy. The total number of pits on a single CD-ROM disc is almost 2 billion. (3)

The information can be read through optical laser techniques. There is no contact between the optical reading head and the disc and is, therefore, not subject to wear and damage. Furthermore, the information is stored in a protective, sealed environment that is very durable and relatively insensitive to dust or scratches. The data also cannot be erased by magnetic fields.

Information is retrieved through microcomputers connected to the CD-ROM drive through a controller interface board. The CD-ROM drive is based on the compact disc player for music and shares many of its features, but they are not interchangeable.

Gates attributes great significance to the combination of CD-ROM with the microcomputer as a medium that is potentially more interactive than any previous consumer product. (4)

Standards

In 1983 Philips and Sony announced a CD-ROM standard for the physical format of storage of digital data on the compact discs. The "High Sierra Group," an ad-hoc group composed of industry representatives, developed a draft standard for the logical file structure. The draft was submitted to the European Computer Manufacturing Association and to NISO, the United States National Information Standards Organization. NISO has established a Compact Disc Data Format Committee to specify a logical file structure. When the standard for a logical file format is accepted the information on CD-ROM discs will become readable as standard files regardless of the computer the drive is attached to, or its operating system.

Economies of scale

Due to the phenomenal sales of audio compact disc players and audio compact discs, the cost of producing both players and discs for CD-ROM have declined and are expected to decline further. Stephen Smith calls it a printing revolution:

> When considered from an applications perspective, prerecorded optical discs can be regarded as a printing revolution: a million pages of computer-readable information "printed" for under $20, every 60 seconds, at the highest standards of data accuracy. Among all the distribution technologies--including the printed page, online computer services and even microfilm--prerecorded optical discs offer the lowest media costs when there are many locations that need access to the same information. In general, as few as 25 or more locations make disc production cost-effective. (5)

Other optical media are in various stages of development, such as OROM (Optical read only memory), WORM (write-once-read-many), DRAW (Direct read-after write), Laser cards, as well as erasable media. In the Spring of 1986, Philips and Sony announced a new type of compact disc, called CD-I (Compact Disc Interactive). CD-I is not a peripheral to a microcomputer, but a self-contained system that will store multimedia information, incorporating graphics, video, sound and text. CD-I has been designed for the mass consumer market as a

multi-media extension of the audio compact disc. However, the mass-produced CD-ROM appears to be the most appropriate and promising format for optical disc publishing.

ADVANTAGES TO LIBRARIES

Local control

Access to information will be under local, in house control and independent of online and telecommunication services. This is of particular advantage to libraries in remote locations where telecommunication nodes are not available and may have a dramatic impact on libraries in developing countries where telecommunications may be unavailable, expensive, or where service may be sporadic A CD-ROM disc can easily be put in an envelope and mailed to any location. Access to information is not restricted by passwords or limited to the hours of service of online vendors and can stay available for access twenty-four hours a day.

Privacy

Local control also provides privacy of searching. Individuals, corporations and government agencies have been concerned about the perceived lack of privacy in online searching. They are delighted that optical discs will provide them with the necessary privacy and security of local access.

Predictable costs

Optical disc searching eliminates charges for connect hours, telecommunications and online or offline prints. It is expected that optical discs will be offered for a flat rate or on a subscription basis. Thus the uncertainty of potential open-ended expenditures for online searching will be removed Libraries will be able to predict and budget their expenditures. Libraries have large expenditures for practising online searching. Much learning takes place "on-the-

job" during actual search sessions. Searching of optical discs does not incur any incremental costs and is ideally suited for information retrieval training and practice. It can be expected that more libra rians will become proficient in information retrieval.

Unlimited access

Following purchase or subscription, the disc can be used repeatedly, allowing unlimited access to the information, in the same way books are used over and over again, without incurring additional costs. Since searching is not affected by connect hour, telecommunication or print charges, the more searches are carried out, the lower the cost per search becomes. As Melin observes: "This is in direct contrast to information on online databases, which may be accessed repeatedly, of course, at an ever-increasing cost for both connect charges and telecommunication access." (6)

Psychological advantages

Searching optical discs has a definite psychological advantage over online searching. The time pressure of the ticking meter in online searching is removed from optical disc searching. The nervousness about making mistakes is reduced since there is no financial penalty for taking time to try various strategies to obtain optimum search results. The searcher is able to utilize a variety of powerful methods of online retrieval: free-text and controlled vocabulary searching, combining of concepts through Boolean operators, qualified searching, ranging, limiting, broadening or narrowing a search or browsing through the indexing vocabulary to find appropriate subject headings. Rick Meyer states: "It is not necessary to "think on your feet" while searching for information on a CD ROM; there are no consequences for mistakes, pauses, deadends, or consultation with the manual. All in all, it's a much friendlier situation."(7)

Enduser searching

In the past, most online searching has been conducted by librarians, information professionals, the so-called "intermediaries." However, with the removal of cost penalties and the breaking down of psychological barriers, optical discs can be seen as a medium that will encourage searching by library patrons, the so-called "endusers." Libraries will be able to offer database searching to their patrons. Optical discs allow browsing and encourage experimentation and learning. The personal computer used for searching optical discs allows the introduction of user-friendly search features, such as menus, prompts, help windows, and tutorials.

Endusers will be able to learn how to perform the more simple searches on their own without the librarian or with minimal assistance. When endusers perform their own searches, librarians will assume the roles of advisors, teachers and consultants. They may still be called upon to conduct sophisticated searches that require the skills of a trained information professional. In some corporate libraries, endusers will continue to rely on intermediaries to conduct searches, due to time pressures. However, some endusers will become quite proficient in information retrieval, particularly in specialty fields or databases.

CONCERNS OF LIBRARIANS

Lack of currency

Online databases can be updated daily through uploading, although many databases are updated only on a monthly basis. Optical discs lack the currency of online databases. They have to undergo a manufacturing process that creates master discs from which copies are

made. A further delay is caused by the need to mail the disc to the library or information center. It is expected that most optical discs will be updated in quarterly or semi-annual intervals. Optical discs are unsuitable if currency of information is important. However, the 3-M Corporation recently announced that they will be able to produce optical discs in a three-day time period. Unfortunately, the cost of frequent mastering and duplication will make such fast turnaround rather expensive.

The concern over lack of currency can be alleviated through hybrid systems that enable users to conduct a local search on the CD-ROM disc and, by pressing a key, allows the user to re-execute the same search strategy online to obtain more recent information.

Lack of standards

Librarians have been concerned about the lack of standards in optical disc systems. It will be essential that the information be searchable on various microcomputers, operating systems and optical disc players. This problem is being addressed by the "High Sierra Group" and by the national and international standards organizations.

Proliferation of search software

Librarians are concerned over the proliferation of search software. Optical disc users may have to learn a wide variety of search languages offered by optical disc publishers. NISO (National Information Standards Organization)has established a committee to develop a standard for a common command language for online interactive information retrieval. The committe has prepared a draft standard that is currently under review.

Lack of access to a great variety of databases

It is likely that libraries will be able to afford only a limited number of databases on optical discs, probably the most heavily used

databases. This will limit multifile searching and will necessitate continued access to the wider range of databases available through on-line systems. A hybrid system combining optical discs and online access suggests itself as a solution.

Lack of installed hardware

There are already many microcomputers installed in libraries and some of them are not yet fully utilized. However, there are also many libraries that do not yet have the necessary hardware needed for optical disc searching. Libraries will have to make a substantial investment in hardware for microcomputers, monitors, optical disc players and printers. However, once this initial one-time investment has been made, the advantage of unlimited use of discs will offset the expenditures for the hardware.

Lack of security

Librarians have expressed concern over the security of discs. Due to the small size of compact discs they could be quite easily stolen. Library staff may need to be assigned to oversee and control use in some fashion. It may also be necessary to place discs or players into cabinets that can be locked.

Database size limitations

Although CD-ROM discs can store a tremendous amount of data, there are many databases that are too large to fit on a single disc. Therefore, it may be necessary to put a database on multiple discs, dividing it by year, by subject or by some other way of segmentation. Another strategy may be of separating indexes from records. However, any multi-disc database requires the swapping of discs, an inconvenience to the user. Efforts are under way to develop so-called "juke boxes" to hold multiple discs. Microcomputers would automatically control the use of the discs.

Queuing Problem

When libraries installed online public access catalogs they discovered very quickly that an insufficient number of terminals in their reference rooms resulted in a queuing problem. With the introduction of CD-ROM workstations librarians may again encounter queuing problems. It is unlikely that multiple users will be able to access a single disc simultaneously, since multiple use degrades the performance. Librarians will have to install multiple work stations to accommodate library patrons.

When should librarians subscribe to optical discs?

Librarians will have to weigh carefully the options of choosing print online or optical disc products. Butler observs that

> Print will continue to be the preferred mode of distribution
> When the information is used briefly and thrown away
> When the information is used only in a linear manner (as in a novel)
> When the information is used in settings that are unlikely to have microcomputers, such as cars and the outdoors
> When the market is so "thin" that only the least expensive publication can be cost-effective (8)

Online will continue to be the preferred mode of distribution when databases exceed the capacity of optical discs, and for those databases that must be updated more frequently than would be practical on disc and for those that are infrequently accessed.

Optical discs will be advantageous for those databases that are heavily used and where the cost of online searching would exceed the cost of subscribing to the optical discs. Meyer sees it as a "classic buy-or-rent decision." (9)

Ready reference works that are frequently consulted are prime candidates for optical discs. Frequent consultation makes them unsuitable for online access for reasons of time and expenditure. There are no telecommunication access protocols that need to be considered and no additional access costs are required to consult these reference works.

In the future, various media (print, microforms, online and optical

discs) will continue to co-exist in libraries and librarians will carefully choose the appropriate product for their particular environment.

ADVANTAGES TO DATABASE PRODUCERS

Lower cost of production

Optical disc publishing is very attractive to publishers due to the low cost of production of optical discs. The publishing industry, over time, has switched to automated production and generates information in machine-readable form, which allows publishers to explore various avenues of electronic publishing, including optical disc publishing. There is an initial high cost for the creation of the master disc that has to be spread across the purchasers of the disc. However, the cost of replication in quantity may be $10 or less. It stores as much material as microfiche costing $150 to make, or books costing $1,000 to print. (10) At the same time, economies of scale will depend on the number of copies sold, rather than the number of connect hours. Due to the compact size of the disc, further cost reductions can be achieved in the handling, warehousing, and shipping of the optical disc product.

Control over distribution

Database producers see optical disc publishing as an opportunity to bypass or to complement online vendors. Distribution of optical discs will bring back the type of relationship with customers they have been accustomed to as print publishers. They are well acquainted with selling subscriptons, an activity that is fundamentally different from selling online usage. Since the advent of online services database producers had relinguished much of their control to online vendors regarding the distribution, marketing and pricing of their databases. Online vendors generally take a large share of the revenues from

online searching. With optical disc publishing, producers will not have to share their revenues with an online vendor, unless they enter into joint ventures with them.

Database producers see optical disc publishing as an opportunity to regain direct contact with purchasers of their product. Some online vendors are not willing to share with database producers the names and addresses of their customers and the usage for each. For years, database producers have been strongly complaining about this lack of information and the corresponding loss of direct contact with customers.

At present, online distribution is highly centralized in a few online services. Some of these services are virtual "supermarkets" of databases. In the future, it is expected that distribution will become more decentralized as producers will offer their databases directly.

CONCERNS OF DATABASE PRODUCERS

Concern over migration

Database producers have entered a period of uncertainty about optical discs. They are uncertain whether optical discs will become the replacement technology for online services or for print publications, or for both. Roger Summit raises the question: "Will CD-ROM attract new customers or will existing customers migrate to it? Will a substitute product result in substitue use? (11)

Will there be simply a shifting of income from print to online to optical disc? Will there be an income reduction, if heavy users switch from online searching to optical disc subscriptions? Summit concludes:

> One likely effect will be that large volume users of the database will migrate to the CD version and save on connect time and royalty costs. Overall revenues from the database might therefore decline. If the disc is priced lower to attact smaller users, it will be a giveaway to larger users: revenues will again decline (12)

Producers are concerned that they will be deprived of income from their existing products when they introduce CD-ROM. However, many publishers see the introduction of CD-ROM products as a way of reaching new customers that they had not been able to attract through online services, especially the potentially large end user market. Products and retrieval software will have to be geared toward that market in addition to traditonal markets.

Concern over pricing

Due to the newness of the market for optical discs and the unanswered questions regarding migration, database publishers are in a quandary about pricing optical discs. Seymour states: "CD-ROM publishers have to recognize that their existing approach to pricing has been made obsolete by CD-ROM's...The 'pay per view' approach to databases has been made obsolete by CD-ROM's." (13) Prices will change from connect hour charges to flat-rate pricing. Online income depends on usage and the higher the usage the higher the income. Optical disc income, on the other hand, depends on the sale of discs and whether the discs are used lightly or heavily has no impact on the income of the publisher. Most optical discs will be sold on a subscription basis to provide continuous income to publishers. Subscription pricing will be justified by the need to update information to keep it current.

Pricing will, naturally, depend greatly on the size of the market and the frequency of updating of discs. Typical update frequencies are monthly, quarterly, semi-annually and annually.

The underlying assumption in the market place is that the purchase of optical discs will be less expensive than online information. The question among publishers arises, whether the reduction in price will bring a corresponding increase in sales to offset the loss of income, or whether or not there will be an increase in income.

No one is certain whether this will happen.

When a publisher uses various channels of distribution, such as print online and optical disc, there are basic costs that will have to be shared by the various media. They will have to share the cost of creation of the database (the intellectual part of writing, indexing, abstracting as well as data entry, data processing and storage). When income shifts from one medium to another,there should be a corresponding shift in the allocation of costs for the creation of the database. Similarly, if a customer (library) uses more than one form of the same product there should be a reduction in price since the library has already paid a share of the creation of the database. If a library subscribes to the printed publication, it should receive a reduced price for online searching or for the corresponding optical disc.

Concern over the market

In all cases, whether it is a print product, online or optical disc, price depends very much on the size of the market. If there is a higher volume of sales in any of these products,prices can be reduced, since there are economies of scale. The optical disc market, as a new market, is highly unpredictable. There is no track record and publishers are uncertain. Meyer observes:

> The common wisdom is that libraries have fixed budgets so that price adjustments can not increase revenues. It is also generally accepted that must-know business information is not price-sensitive. Even these two factors have not been adequately quantified. (14)

Can the market for optical discs be increased? Librarians and endusers of optical discs will have unlimited access to the information on the discs. It is expected that it will be an incentive "to get the maximum use of what has already been bought. This factor will increase utilization among existing users and draw more people into searching, creating a larger user base that will lead to market growth as more users will become familiar with information services." (15)

Concern over a secondary market

Publishers will have to deal with the possibility of a secondary market for used CD-ROM discs. Since each updated disc includes the contents of the previous disc, a situation may develop where older discs may be sold in a secondary market at discount prices. Older discs may be of interest to customers, if currency is not significant. Publishers may counteract this development by offering discounts for multiple copies or by building into the software features that prevent usage of older discs.

Concern over copyright violations

It will be simple to copy information from the CD-ROM disc to the microcomputer and such downloading activities may be expected. Copyright laws are not specific on the issue of downloading. Single use of downloaded information may be considered "fair use." Downloading for multiple use generally requires permission from the publisher. Reselling of downloaded information could lead to a loss of revenue and is clearly a violation of copyright laws. CD-ROM users will have to observe copyright restrictions, especially if optical discs use pre-existing copyright information, for example, for the full text of journal articles. University Microfilms International (UMI) as a supplier of full-text journals, has designed a way of monitoring and paying the royalties it is legally required to pay for the printing of articles. "UMI has built into the workstation a feature that electronically polls the system, probably on a monthly basis, to identify which and how many articles have been printed from disc." (16)

THE CHALLENGE OF OPTICAL DISC PUBLISHING

A different type of publishing

Only a casual observer of optical disc publishing might think that it is similar to traditional publishing. Publishers face numerous new and unfamiliar challenges. As in traditional publishing there is the initial collection and editing of information. However at that point information needs to be organized, indexed and presented in a different way for the optical disc. The disc has to be mastered and duplicated and software has to be written to make the information searchable in conjunction with optical disc readers. Laub states:

> This culture jump is attractive to some traditional publishers and scary to others. It creates opportunities for organizations not traditionally involved in publishing, either to take full responsibility for the job or to act as service bureaus to do just the newfangled thing in support of traditional publishers. (17)

The need to supply hardware

One of the new aspects to publishers is the potential need not only to deliver the optical disc, but also the necessary hardware and software to make the information retrievable. Publishers need to determine the hardware that already has a large installed base among its customers. It they are not available, the publisher may have to supply microcomputers, CD-ROM drives and printers and may even become responsible for the installation and service of hardware.

Retrieval software

The role of publishers will be extended. They will have to become involved in retrieval software and in system design or they will have to work jointly with service bureaus that have experience in this area. Optical discs require retrieval software written for the microcomputer. To attract a maximum number of users it is desirable to write retrieval software that is usable by endusers as well as intermediaries. Different types of users should have the option to choose the mode of access they prefer.

Enduser software will have to be user-friendly so that either no training or minimal training is needed to search optical discs. Menus, prompts, help windows, tutorials, search assistance and "forgiving" features will have to be written into the retrieval software. Some database producers (H.W. Wilson and Disclosure) have already developed two different levels of enduser software, ranging from simplistic browse searching to more sophisticated searching, including such features as implied Boolean operators, truncation, qualifying and limiting a search. Searching has to become "intuitively" understandable by the enduser. (18) Ideally, the search software should enable endusers to start searching on a simple level and then allow them to graduate to the more sophisticated level of the intermediary.

Software for the trained intermediary, librarian, or information specialist should have at least those features that online users have become accustomed to. Search software should allow for searching free text as well as controlled vocabulary. It should allow for online thesauri to find broader, narrower, related terms and cross references; Boolean operators, truncation of terms, ranging, limiting, saving of search strategies for later use. In addition, the full capabilities of the microcomputer should be utilized with such features as colors, highlighting of hits, windows, online turorials and help screens. Software will have to made available not only for the retrieval of information, but also for post-processing that will allow users to interact with existing software for word processing, spread sheets, typesetting and statistical analysis. (19)
Publishers will also have to provide training, documentation and telephone assistance to users of retrieval software.

ONLINE VENDORS AS SYSTEM INTEGRATORS

Many database publishers will not be able to carry out premastering activities or write retrieval software for optical discs. They will have to enter into agreements with companies that have the necessary expertise in those areas. Independent companies have sprung up to handle various production aspects as service bureaus or on a joint venture basis.

However, it is also apparent that vendors of online databases are ready to offer their services in the production of optical discs They have capabilities for file processing and have extensive experience in retrieval software. They are able to transform data they receive into searchable data, using a uniform search language, uniform search qualifiers and uniform formats to those on the online system. Librarians are reluctant to learn new search features and search languages with every new vendor of optical discs. They are already familiar with the search langauges of online vendors and it will be easy to transfer that knowledge to the optical disc. Vendors will, therefore, attempt to replicate online search languages for optical discs.

Vendors can also offer a wealth of experience in marketing of information products, in training, documentation and other user services. If identical search systems are used for optical disc systems and online services, many of these activities can be combined, providing savings to database producers and savings in time, effort and money for librarians.

Hybrid systems

It is a foregone conclusion that the major vendors of online systems will develop hybrid systems. They will replicate their mainframe search software for the microcomputer, to be used for searching on the CD-ROM. This will allow users to search the optical disc and

then, if they wish to obtain the latest information, to log on automatically to the online database to search for information not yet available on the disc.

Searching on a hybrid system will be facilitated by the use of the same data structure, same search language and search qualifiers. Software will be available that will save a search strategy and re-execute it online, simply by pressing a key. The software will also automatically limit the search to information not yet available on the disc.

If appropriate, current and frequently used information could be stored on optical discs while retrospective data is stored online. Hybrid systems will also be very useful to libraries with only a limited number of discs. It is likely that many libraries will have only heavily used databases available on discs. There will be a continuing need for online services to allow access to information not accessible locally on optical discs.

Meyer also sees another use for hybrid systems:

> For databases too large for CD ROM instead of taking a subset or partitioning onto multiple discs, it could be very convenient to keep indexes or abbreviated records locally. When relative hits are found locally, corresponding complete online records could be retrieved. Bibliographic data can be local and corresponding full text, or even images, remote. (20)

Conclusion

The information community (librarians, database producers and online vendors) is at the threshold of implementing a fascinating new technology that will affect the nature of information distribution. There are many hopes but also many concerns on the part of all members of the information triangle.

Librarians will carefully weigh the advantages of CD ROM against their concerns regarding the new technology. Will local control, privacy, unlimited access, and psychological values outweigh the

lack of currency, lack of completeness, and lack of security? Publishers will also carefully weigh lower production costs and control over distribution against their concern over migration pricing and the market size. Optical disc publishers will have to confront the challenge of working with a new technology that differs substantially from traditional publishing with regard to hardware and software, type of marketing and customer support. CD-ROM offers market opportunities for new information products, whether they be segments of existing databases, combined subsets of different files, or completely new products. Publishers will have the opportunity to be innovative in the way they deliver information. Librarians and library patrons will benefit from innovative new information products.

A hybrid system combining the advantages of optical discs and those of online distribution suggests itself as a solution to the needs of librarians, publishers and online vendors.

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Databases Created by Japanese Economists

by

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I. Database Propagation and its Compilers

Recent propagation of computer network has stimulated the wide use of databases, starting with bibliographic databases like LCMARCII, now called USMARC, Chemical Abstracts which have a long tradition of wide circulation in printed form. The success of these bibliographic information databases encouraged enterprises to compile more sophisticated databases of fact data. To compile fact data databases requires schematisation of fact information to be retrieved and evaluation what should be included and what should not. Thus promoters of compilation of fact data databases are coming from academic circles in most cases except for statistical data. Statistical data database is more urgently pursued by business world and government authorities and so commercial database vendor appears in this field. Now various huge databases produced in Western countries are widely circulated all over the world since 1960s.

In the academic world of Japan a special government grant project started since 1973: Advanced Information Processing of Large Scale Data and then Formation Process of Information Systems and the Organization of Scientific Information. This project sponsored by he Ministry of Education, Science and Culture of Japan was ended in 1980. By this project many research groups were encouraged to produce databases as common resources of the academic world. But on average these producers have little concern about their wide circularity and are satisfied with communication among limited researchers closely related to their projects. Other people, however might have been interested in these databases, still remain without accessing them. They may try to produce a

similar database which are also expected to be used in their limited group only.

In 1984-5 a small research group headed by Professor Hideaki Chihara was organised to investigate how databases are produced for academic information by university people or university related people. This group made a questionnaire survey in three fields such as chemistry, medical and drug science and economics. Totally 662 universities, institutes and academic societies are requested to respond and 275 databases are reported. Among them 97 databases are reported in the field of economics. (This survey will be abbreviated as AIDB (Academic Information Database) Survey.) Analyses of these data and other similar surveys conducted also by the present author will reveal actual situations and problems which compilers of academic databases face in the field of economics.

II. Databases among Economists

Among the various fields of social sciences economics have attracted computer oriented people in Japan. But major use of computer is found in econometric analysis and so the database used and constructed are stemmed in statistics not in bibliographic information. In Japan about six thousand economists are working at universities and about thirty percent of them are engaged in empirical research of Japanese economies. One questionnaire survey called Survey of Social Scientists' Demand for Japan's Socio-economic Statistics (abbreviated as SSDJSS Survey) in 1983-4 tells us how they use statistic databases. Among 2,213 people 1,063 responded but effective answer was from 1,015 people. These people were selected from various lists and the selection criteria

was that they had written some articles on Japanese economies or societies. About fifty seven percent of the respondents had used computer much or less and, in the case of the people whose age were under fifty, sixty percent was computer user. However this high percentage of computer user does not guarantee the high rate of database use. Among 876 people who used statistics compiled or surveyed not by themselves but by other persons like governments only 3.08 percent people used on-line databases which were distributed by commercial database vendors and suitable for their use. About 26.95 percent people converted the figures in printed books into machine readable form. Some of them knew availability of machine readable file but complained that to input by themselves was cheaper than to purchase such files which were sold in one set containing more information than they needed.

Another Survey on Statistics Use By Major Companies (abbreviated as SUMC Survey) in 1983 shows that 26.29 percent of 213 companies answered that they used commercial databases or data files. This survey sponsored by the Federation of Prefectural Statistical Societies (Zenkoku Tokei Kyokai Rengoukai in Japanese: ZENTOREN as an acronym) was based on the questionnaire survey to 500 companies randomly selected from 1,425 companies whose stock are dealt at Tokyo Stock Exchange Market and 47.2 percent companies replied to the survey. On the other hand another survey using similar questionnaire for local companies surveying 1,500 companies in Sapporo, Osaka, Niigata and Fukuoka, which was done in 1984, 44.3 percent companies responded. (This was also sponsored by ZENTOREN and talled Survey on Statistics Use by Smaller and Regional Companies (abbreviated as SUSRC Survey).) Only 8.93 companies used on-line commercial databases including bibliographical database. This

implies that even small regional companies much relied on commercial on-line databases than academic users.

One reason of low usage rate of commercial database among university people is the difference of the data used between university economists and business economists who are forming a big market for database vendors. Another reason is the high price barrier of commercial databases for academic users. In most cases university faculties pay much attention on the building library collection but less on statistical database use. Much money are spent for purchasing printed statistical data instead of on-line database. This tendency may be applicable to other databases like bibliographic information. A probable excuse for this is that university authorities are not convinced of a usefulness of such databases which require certain amount of money for subscription and leave nothing in the case of no access. Books and journals may remain as a property of a university even if there is no reader at the time of purchasing and expect to be read by the other faculty member and/or students in future generation.

Before going to a hasty conclusion about the database usage among academic economists let's have a glance at the situations how academic people are compiling databases.

III. Database Compiled by Academic Economists

AIDB Survey in 1985 listed up 97 databases compiled by economists but these are not strictly comparable with those defined in other surveys due to the difference of deffinitions caused by the scope and nature of surveys referred. One of the aims of the AIDB Survey is to assess the resources which are qualified to be converted into machine

readable form in future in order to provide a basis for political actions to encourage database producers. Thus the word "database" used in the survey is a common word and means a cumulation of data in a schematised way to be easily converted into machine readable form. Judging from the answers to the survey economists are accustomed to the concept of database used in computer science or library and information sciences and so only 14 out of 97 (14.4 percent) are the cumulation of data without being converted into machine readable form. And these 14 are reported expecting some financial assistance to be compiled into a computer managed database.

The databases reported are not yet fully matured to be shared in the academic world like other commercial databases now available. Eight databases are alive and updated but two are abandoned without getting maintenance. Fifteen are regarded to be completed because no new entry of data is expected. But those reported to be alive do not imply that they got updated regularly for some of them do not have enough money to update. Such unstableness of database building is due to their financial sources. One fourth of the databases used more or less private resources at their starting period of a project. As to the current cost for running database 54 answered that they were operated with some assistance of outside financial resources like government research grant and 41 did not answer the question including 17 which were abandoned or completed.

Another evidence of unstableness is that one thirds are built by individual researchers and only two thirds are compiled by groups or organisations. In principle database should kept as a routine work of a certain organisation. These facts suggest that many of them are still

at a stage of private data files or data bank for private use. This is reflected in the size of a database. The size distribution of logical records in a database has two peaks; one is in the class more than 1,000 and below 5,000 and the other in the class of more than ten thousand and below fifty thousand. But the definition of a logical record in the questionnaire was rather vague and so in some answers a large input-output matrix was counted as one logical record and in others an element of a input-output matrix was counted as one logical record. The size distribution of database in physical term may be more suitable to evaluate the size of a database, if we neglect the problem of inclusion or exclusion of index files into the size of database. The size distribution of database in physical term also has two peaks; one in the class of one MB to ten MB and the other in the class of two hundred MB. And the size of data to be updated amounts to ten MB.

The contents of these databases are roughly classified as bibliographical information and fact information. Majority of the latter is statistical data. But many of them contains both information. Totally 73 databases are statistical ones and among them only half contains only statistical data.

Academic databases differ from commercial ones in various aspects. One is its narrowness of scope but extensiveness of coverage and contents. This implies that potential users are small. The second is its evaluation procedures of information included. This leads to the third characteristics. Academic information is matrix of various information obtainable in well schematised way with annotations if necessary. For example, historical statistics are gathered with evaluation and adjusted

or reestimated to be comparable with current classification scheme. Sometimes lacks of data are restored through scattered information.

IV. Evaluation of Academic Databases

Let's examine the exhaustiveness of AIDB Survey. Another survey conducted by MUSE (Multi-use Socio-economic) Data Bank Project headed by Professor Shuntaro Shishido in 1985 listed statistical database and/or data bank among economists and sociologists. The scope of MUSE Survey was different from AIDB Survey because it covered sociologists and political scientists and software systems built up by them. Totally 96 database and/or data banks and systems are registered. But among them those answered by sociologists and political scientists were quite few. However 31 are software and two are miscellaneous including classification converter. Sixty-five databases excluding software systems are comparable to those in AIDB Survey. Only 13 databases are reported in both surveys. And so at least 149 databases have been constructed among economists at universities and academic societies. But majority of the databases added by MUSE Survey are macro econometric model oriented databases. This implies that some of them are constructed on the data downloaded from the commercial databases.

It may be accepted that academic databases are essential supplement to commercial databases. But academic ones need not be circulated through one-line system. Magnetic tape or disk is sometimes enough for circulation. And so a data bank system like ICPSR in United States may act for needs of database.

For this purpose documentation of files is necessary but this is often overlooked by researchers themselves. Whether having a sufficient

documentation or not determines that a certain private data file grew up into a database shared by other users. As to the 97 databases in AIDB Survey half of them did not make and service to outside their groups. This is reflected in the poorness of documentation in those non-service databases. Those served to others are well equipped with documentation of files and user's manuals. Those files without adequate documentation will be soon unusable even for the original compiler. And so keeping a practice to make a good documentation is one of the problems to be solved in future. Obligation of donation with suitable documentation to a certain data bank may be conditioned for the grant research in future. Another possible problem which may occur in near future is that recent databases which are apt to use Chinese characters due to technical improvements of computer processing in Japan requires additional cost for international exchange of databases. Formerly most of the indexing terms were compelled to use alpha-numeric codes due to the cost restriction of inputting Chinsese characters. For our daily use this is unnecessary burden and we are emancipated from this restriction.

Finally more serious problem is how to supply financial support. Since the compilation of academic information will not pay for the construction cost for ever, it is necessary to organise a financial support system.

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IFLA General Conference, Tokyo, 1986

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The Role of the Libraries for the Assistance of Research in the Field of Social Sciences

A.Kasyanenko

VGBIL, Moscow

USSR

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The role of the libraries for the assistance of research in the field of social sciences

In the Political Report of the CPSU Central Committee to the 27th Party Congress Mikhail Gorbachev underlined the current goals of the social sciences in the Soviet Union. Said he, "Time sets the question of the social sciences broadly, tackling the concrete requirements of practice and demands that social scientists should be sensitive to the ongoing changes in life, keep new phenomena in sight, and draw conclusions that would correctly orient practice...The Central Committee favours this way that makes it possible to obtain significant results in theory and practice".

An important part in providing the scientists and researchers with information on social sciences play the libraries and other information institutions.

The existing in the Soviet Union information system-called State Automatic System of Scientific Information on Social Sciences - incorporates the institutions of the following levels: all-union information centers; central specialized departamental information bodies; republican centers, incorporated into Republican Academies of Science; information centers at educational, scientific institutions and libraries.

The Institute of Scientific Information on Social Sciences of the USSR Academy of Sciences (INION) is the head institution of the system and is acting as All-Union Information Center. The Institute collects, prosesses and distributes the information on social sciences from foreign and domestic sources.

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The main goal of INION activity is the production of bibliographies and other kinds of information mostly in printed form covering social sciences. Two main publications of this kind are: "Social Sciences in the USSR" and "Social Sciences Abroad" which publish abstracts from Soviet and foreign sources. The first one is issued in 7 and the second - in 9 series. The journal "Social Sciences in the USSR" provides the abstracts in Russian and other languages of the Soviet Union, the journal "Social Sciences Abroad" - in 30 foreign languages. Both are issued bimonthly and have subject and author indexes. Other types of journals provide abstracts of more specific kind. Each of the journals covers a certain subject of social sciences such as economy, philosophy, history, culture and others. They provide the scientists with information on the latest developments and trends in a certain field of social sciences in the USSR and abroad.

The most complicated kind of information is provided by analytical reviews of literature issued by INION. Those reviews give the information on modern schools and theories in social sciences on the avtivities of the leading institutions in the field and evaluate the state of research in the world.

The INION activities include the publication of a number of bibliographies, covering all aspects of social sciences in many countries. They include current bibliographic information on social sciences from local and foreign sources. Thirty different series of bibliographies are issued monthly. The subject bibliographies "New Soviet Literature on Social Sciences" and "New

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Foreign Literature on Social Sciences" are published in 15 series. The bibliography "New Soviet and Foreign Literature on Social Sciences" is issued in 15 series on a countrywide principle. Some issues are devoted to certain countries, some - to different regions of the world, such as Asia, Africa, Middle-East, etc.

The bibliographies provide information on the new acquisitions received by the V.I.Lenin State Library of the USSR, INION, the All-Union State Library of Foreign Literature and a number of others. All in all they contain information on approximately 260 000 titles of monographs, serials and periodicals published in the USSR and abroad in more than 100 countries annually.

Another kind of publications issued by INION are retrospective subject bibliographies and special bibliographies, covering Soviet and foreign literature, some of which are prepared on the request from scientists and institutions. The Institute provides reference assistance to researchers and institutions, publishes index to foreign periodicals received by Moscow libraries. INION also participates in compilation of a number of international bibliographies on history, economics, philosophy, sociology, etc.

Besides the INION a large amount of bibliographic and information work is being done by the largest libraries of the USSR, such as: the V.I.Lenin State Library of the USSR, the All-Union State Library of Foreign Literature, the State M.E.Saltykov-Shchedrin Public Library, the State Public Historical Library of the RSFSR, the Library of the USSR Academy of Sciences and others.

The V.I.Lenin State Library, for example, participates in a State system of scientific information as a Central Departamental Information Body of the USSR Ministry of Culture (INFORMKULTURA) and provides information on general aspects of culture and librarianship.

In 1986 the V.I.Lenin State Library is planning to prepare 278 informational publications including bibliographies, abstracts, and reviews. Bibliographic information is published in a form of indexes of Soviet and foreign literature in 9 series (12 issues annually).

The indexes contain information on Soviet and foreign monographs, periodical articles, unpublished bibliographies and monuscripts deposited in INFORMKULTURA in Russian and other european languages.

Since 1983 the Library started to produce several series of bibliographies using computers and photocomposition. The Library continues to use computer for producing such bibliographic series as "Librarianship and Bibliography in the USSR", "Cultural and Educating Activity. Amateur Art", "General Problems of Culture", "Museums and Preservation of Cultural Heritage".

Besides the mentioned publications the V.I.Lenin Library issues regularly two newsletters: "Culture and Art in the USSR" and "Culture and Art Abroad". In 1986 the V.I.Lenin State Library is planning to issue 143 newsletters.

The All-Union State Library of Foreign Literature as well as the V.I.Lenin State Library of the USSR participates in a state system of scientific information, functioning as an information body in the field of librarianship abroad.

The Library has a special information research center dealing with librarianship abroad. The Center functions as part of departamental information body on arts and culture with headquarters in the V.I.Lenin State Library.

Annually the center produces 12 issues of index "Librarianship and Bibliography abroad", 12 issues of newsletter "Culture and Art Abroad" and an analytical review. Here are the titles of some newsletters issued in 1985-1986: "The Libraries in Nepal"; "The Future of Card Catalogues"; "The Development of Librarianship in Japan"; "The Modern State of Librarianship in Peoples Republic of China".

The Center analyzes the material from 187 foreign journals in 17 languages from the holdings of the All-Union State Library of Foreign Literature and the V.I.Lenin State Library of the USSR".

The All-Union State Library of Foreign Literature prepares a number of bibliographies on social sciences. They are issued in 5 following series: The Preservation of Peace and Prevention of Nuclear Disaster - the Main Task of Modern Times; Antifascist Resistance in Europe During the W.W.II, Leaders of the International Communist and Labour Movement; Contemporary Problems of World Politics and International Relations; Cultural Relations between the USSR and Foreign Countries.

A number of bibliographies published in recent years were devoted to different problems and personalities of the developing countries. Such bibliographic works as "Social and Political Structure of the Developing Countries of Asia and Africa 1970-1980", M., 1983, "Social Aspects of Racial and Ethnical Problems

in the Southeast Asia 1960-1980", M., 1984. "Kenyan Authors 1960-1980". M., 1982. "Folklore of Magrib Countries", M., 1980., and others.

The Library of Foreign Literature issues the "Union Bulletin of New Acquisitions to the Libraries of the USSR. Social Sciences" (6 issues annually). Now the library bibliographers work on multivolume "Index of Foreign Periodicals and Serials. Social Sciences". The index will include information on publications received by 80 largest libraries of the USSR.

The important reference for librarians, publishers and literary critics provides the journal "Contemporary Fiction Abroad" (6 issues annually) published by the Library. The journal publishes reviews, critical essays and annotations on new works of fiction. About 500 new books are analyzed annually.

The other libraries of the USSR participating in the State system of scientific information on social sciences produce a number of bibliographic and reference works. The information about all of them is placed in INION publications.

The central departamental bodies of information on social sciences are functioning in cooperation with the all-union centers. Such centers of information cater the following fields:

- education - Department of Information, the USSR Ministry of Education
- arts and culture - Information center, the V.I.Lenin State Library of the USSR (Ministry of Culture)
- publishing - Information Center on publishing, Bookchamber of the USSR

- archives administration - Department of Scientific Information, the All-Union Research Institute on Documentation and Archives Administration.

Such centers also exist in the field of professional training, prices and credit, state and law, statistics.

The Academies of Sciences at the Union Republics carry on an extensive research in the field of social sciences. In order to collect information needed for the research, in the republics were created the information centers on social sciences. The aim of the republican Centers is to maintain the collection of documents about the republic and to provide scientists and researchers with bibliographic and other information in the field of social sciences. The activity of each republican center is affected by the current needs of the Academy and by the economic, cultural and social features of the republic.

The Azerbaijanian center, for example, specializes in collecting data on Azerbaijan studies from Soviet and foreign sources. Another important facet of the center's activity is the collection and analysis of information on political and social developments in Middle and Near East. This activity is based on a long tradition of oriental studies in the republic.

The activity of the similar centers in other Union Republics is organized in the same way.

The Institute of Scientific Information on Social Sciences of the USSR Academy of Sciences is the head coordinating body for the activities of all information centers. The coordination is becoming more and more important since the number of information centers is growing and its introduction of the new technology demands compatibility with the all systems and processes.